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ORIGINATION, DIVERSITY, AND EXTINCTION METRICS ESSENTIAL FOR ANALYSIS OF MASS BIOTIC CRISIS EVENTS: AN EXAMPLE FROM CRETACEOUS AMMONOIDEA

COLLOM, Christopher J., Department of Geology, University of Colorado, Boulder, CO 80309, U.S.A.

Traditional mass extinction research (Raup & Sepkoski, 1984, 1986) has predominantly concentrated on statistically demonstrating that i.) "mass extinction intervals" are significantly above background levels of familial and generic extinction in terms of extinction percentage, extinction rate, and per-taxon extinction rate; ii.) "mass extinction intervals" occur on a set periodicity throughout geologic time, which has been estimated to be some 30 MYR in duration. The published literature has given little emphasis to equally important considerations and metrics such as origination rate, standing diversity, and rate of generation of new taxa DURING mass extinction intervals. The extent to which a mass extinction affects the regional or global biota, it's "severity index" if you wish, must ultimately be gauged by taking into consideration both the number of taxa which become extinct at or near the event (stage) boundary, and the number of taxa which are either not affected at all by the extinction or actually evolved during or shortly before/after the extinction interval. These effects can be seen in Cretaceous Ammonoidea (at the genus level), and their combined usage allow better insight into paleobiological dynamics and responses to mass extinction and its affect on this dominant Molluscan organism.

Raup, D.M., Sepkoski, J.J., 1984, Periodicity of extinctions in the geologic past: National Academy of Sciences, v.81, p.801-805.

Raup, D.M., Sepkoski, J.J., 1986, Periodic extinction of families and genera: Science, v.231, p.833-836.

